

**REMARKS**

Favorable reconsideration of this application is respectfully requested in view of the amendments above and the following remarks. By virtue of the amendments above, Claim 2 has been canceled without prejudice or disclaimer of the subject matter contained therein. In addition, Claims 1 and 16 have been amended. Therefore, Claims 1 and 3-23, are currently pending in the present application, of which, Claims 1, 10, and 15 are independent.

No new matter has been introduced by way of the claim amendments and entry thereof is therefore respectfully requested.

*Drawings*

The Official Action does not indicate whether the drawings filed on September 11, 2003 are approved. However, since the Official Action does not present any objections to the drawings, the Applicants will assume that the drawings have been approved. Should this assumption be in error, the Examiner is respectfully requested to inform the Applicants of such error in any future correspondence.

*Claim Objection*

The Official Action sets forth an objection to Claim 17 as allegedly containing informalities. More particularly, the Official Action states that the recitation "such precision" lacks antecedent basis and that appropriate correction is required. It appears, however, that Claim 17 was erroneously cited as containing this alleged informality because Claim 17 does not contain the recitation "such precision". Accordingly, the Examiner is respectfully requested to withdraw the objection to Claim 17.

In most likelihood, the Official Action should have cited to Claim 16, which includes that recitation. Claim 16 has been amended in minor respects to be in better compliance with USPTO rules. In addition, the amendments to Claim 16 were not made for the purposes patentability.

*Claim Rejection Under 35 U.S.C. §102*

The test for determining if a reference anticipates a claim, for purposes of a rejection under 35 U.S.C. § 102, is whether the reference discloses all the elements of the claimed combination, or the mechanical equivalents thereof functioning in substantially the same way to produce substantially the same results. As noted by the Court of Appeals for the Federal Circuit in *Lindemann Maschinenfabrik GmbH v. American Hoist and Derrick Co.*, 221 USPQ 481, 485 (Fed. Cir. 1984), in evaluating the sufficiency of an anticipation rejection under 35 U.S.C. § 102, the Court stated:

Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim.

Therefore, if the cited reference does not disclose each and every element of the claimed invention, then the cited reference fails to anticipate the claimed invention and, thus, the claimed invention is distinguishable over the cited reference.

**U.S. Patent Publication No. 2003/0072349 to Osone et al.**

Claims 1-3 have been rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by the disclosure contained in U.S. Patent Publication No. 2003/0072349 to Osone et al. This rejection is respectfully traversed because the present invention as set forth in independent

Claim 1 and the claims that depend therefrom are patentably distinguishable over the disclosure contained in Osone et al.

Initially, it is respectfully submitted that Osone et al. does not qualify as a proper reference for anticipation under 35 U.S.C. § 102(b). That section of the U.S. Code states that a patent shall be granted unless “the invention was patented or described in a printed publication in this....more than one year prior to the date of application for patent in the United States.” The Osone et al. document was published on April 17, 2003 and the present application was filed on September 11, 2003. Clearly, therefore, the present application was filed within the one year period following publication of the Osone et al. document and Osone et al. is not a qualifying reference under 35 U.S.C. § 102(b).

In any respect, the Osone et al. document does not anticipate the present invention as set forth in Claim 1 because Osone et al. does not disclose each and every element claimed in Claim 1. For instance, Osone et al. does not disclose that the pressure applied at each of a plurality of different pressures is adjusted to maintain a constant pressure on the thermal interface material (TIM) sample even though the TIM sample expands and contracts with changes in its temperature. The Official Action asserts that this feature is disclosed in paragraphs 99 and 100 of Osone et al. It is submitted, however, that those paragraphs of Osone et al. do not disclose this feature.

Instead, paragraph 99 of Osone et al. describes FIG. 7, which is described as “a diagram for showing a configuration of a measuring apparatus when load is kept constant or when a time-based load profile of load is defined and load is changed according to it, that is, load is controlled to measure the thermal resistance of resin including its interface.” As may be seen from this passage in the Osone et al. document, paragraph 99 does not discuss that the load is adjusted to maintain a constant pressure on the resin as the resin expands or

contracts. In addition, this paragraph also discusses how the load is controlled to measure the thermal resistance of the resin, which differs from adjusting pressure at each of a plurality of different pressures to maintain a constant pressure on the TIM sample as the resin expands or contracts.

Paragraph 100 of Osone et al. discusses that the measurement of thermal resistance as described in paragraph 99 “is particularly effective when changes in the length or thickness of the resin in the direction of passing heat or in the direction parallel to the load are small relative to the changes of the load and the elapsed time. However, needless to say, it is an effective method for the resin that does not correspond to the above described conditions.” Osone et al. clearly states here that when there are changes in the size of the resin, that the method described in paragraph 99 is ineffective. In addition, Osone et al. clearly states here that the measurement of thermal resistance described in paragraph 99 is effective only when the changes in length or thickness of the resin are small relative to the load and elapsed time. Therefore, paragraph 100 of Osone et al. does not disclose that the pressure applied to a TIM sample at a plurality of different pressures are adjusted to maintain a constant pressure even though the TIM sample expands and contracts.

Accordingly, Osone et al. fails to disclose each and every element claimed in Claim 1. The Examiner is thus respectfully requested to withdraw the rejection of Claim 1 as allegedly being anticipated by the disclosure contained in Osone et al. Osone et al. also fails to anticipate Claim 3 based at least on the fact that Claim 3 depends upon allowable Claim 1. In addition, Osone et al. fails to disclose each and every element claimed in Claim 3 of the present invention.

The Official Action alleges that paragraph 8 of Osone et al. discloses all of the elements of Claim 3 of the present invention. Paragraph 8 of Osone et al. describes a

stationary method for determining thermal conductivity and that the stationary method is the simplest method. Osone et al. describes that in the stationary method, a constant amount of heat is caused to flow through a test specimen and the “temperature distribution of the test specimen in the direction of flowing heat is measured at a constant spacing”. This is section differs from Claim 3 of the present invention, which includes the step of “delaying the step of characterizing until temperature measurements in the step of measuring have reached a steady-state.” In fact, Osone et al. does not disclose that a characterizing step is delayed nor that a steady-state is reached. Therefore, Osone et al. cannot anticipate Claim 3 of the present invention.

**U.S. Patent No. 3,817,109 to Audet et al.**

Claims 1-3, 8 and 9 have been rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by the disclosure contained in U.S. Patent No. 3,817,109 to Audet et al. This rejection is respectfully traversed because the present invention as set forth in independent Claim 1 and the claims that depend therefrom are patentably distinguishable over the disclosure contained in Audet et al.

Audet et al. discloses a hyperbaric simulator in which properties of a material are evaluated under simulated deep sea pressures. In this regard, Audet et al. discloses a pressure chamber 11 within which are provided various testing equipment. For instance, with respect to FIG. 3 of Audet et al., the testing equipment is a thermal conductance tester. As shown therein, the thermal conductance tester includes water chillers 78 and 79 and heaters 70 and 71. Two samples 84 and 85 are positioned to abut the heaters and a pair of water baths 86 and 87 are formed adjacent respective opposite sides of the samples 84 and 85. The

temperatures of the water contained in the water baths 86 and 87 are controlled by the thermoelectric chillers 78 and 79.

The Official Action asserts that Audet et al. discloses all of the elements claimed in Claim 1 of the present invention. For instance, the Official Action asserts that the samples 84 and 85 of Audet et al. are similar to the thermal interface material sample claimed in Claim 1. This is not an accurate assertion because none of the materials disclosed in Audet et al. are similar to the thermal interface materials disclosed in the present invention. Instead, Audet et al. discloses that the materials tested are for use in deep sea swimmer suits. (Col. 1, lines 5-7). In this regard, the materials include those having insulative properties, such as neoprene. (Col., lines 8-10). Thus, the materials are not thermal interface materials.

The Official Action also asserts that Audet et al. discloses that a constant pressure is maintained at each of the plurality of different pressures in spite of any changes in size of the thermal interface materials. The Official Action asserts that these features are disclosed in column 2, lines 45-48 and column 7, lines 34-50 of Audet et al. . It is submitted, however, that those paragraphs of Audet et al. do not disclose these features.

Instead, column 2, lines 45-48 of Audet et al. refer to a thickness tester component deployed in a “pressure chamber 11 which is maintained at a selected gas pressure through a pressure supply source 12 and a pressure port 13.” It is not at all understood as to how the Official Action concludes that this passage in Audet et al. is equivalent to the features claimed in amended Claim 1. More particularly, maintaining a pressure chamber at a selected gas pressure is not the same as adjusting the pressure applied to each of a plurality of different pressures to maintain a constant pressure on thermal interface material sample even though the thermal interface material expands and contracts with changes in its temperature.

Therefore, the passage contained in column 2, lines 45-48 of Audet et al. do not anticipate Claim 1 of the present invention.

In addition, column 7, lines 34-50 of Audet et al. describes the pressure range of the thermal conductance tester in terms of seawater and concludes that the “thermal conductance tester provides a means of determining the influence of pressure on the thermal protection supplied by a particular material sample and, in conjunction with the thickness tester, gives thermal conductivity data.” Again, there is nothing in this passage of Audet et al. to indicate that Audet et al. intended to adjust the pressure applied to each of a plurality of different pressures to maintain a constant pressure on thermal interface material sample even though the thermal interface material expands and contracts with changes in its temperature as claimed in Claim 1 of the present invention.

Accordingly, it is respectfully submitted that Audet et al. fails to disclose each and every element claimed in Claim 1. The Examiner is thus respectfully requested to withdraw the rejection of Claim 1 as allegedly being anticipated by the disclosure contained in the Audet et al. document. In addition, the rejection of the claims that depend from Claim 1 should also be withdrawn for at least the reasons set forth with respect to Claim 1.

The claims that depend from Claim 1 are allowable over the Audet et al. disclosure for reasons in addition to their dependencies. For instance, with respect to Claims 3, 8 and 9 of the present invention, Audet et al. fails to disclose the elements claimed therein. In this regard, contrary to the assertion in the Official Action, column 7, line 6, of Audet et al. does not disclose all of the features claimed in Claim 3. For instance, the passage contained in column 7, line 6 of Audet et al. basically states that “the heat input into the sample is equal to the heat output of the sample” when the system reaches thermal equilibrium. Thus, Audet et al. is identifying a known characteristic of heat transfer when a system reaches thermal

equilibrium for purposes of determining the conductance through a material. This clearly differs from the features contained in Claim 3 of the present invention.

In addition, with respect to Claims 8 and 9, the Official Action improperly asserts that Audet et al. discloses a thermal resistance curve. Instead, as seen in FIGS. 4 and 5, the graphs created in Audet et al. respectively pertain to a correlation between a material thickness change to hydrostatic pressure and a correlation between a differential pressure and a center deflection. The computations performed in Audet et al. pertain to physical changes in the material at various pressures and not at different temperatures. Therefore, Audet et al. does not disclose the features of Claims 8 and 9 of the present invention.

#### Claim Rejection Under 35 U.S.C. §103

The test for determining if a claim is rendered obvious by one or more references for purposes of a rejection under 35 U.S.C. § 103 is set forth in MPEP § 706.02(j):

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Therefore, if the above-identified criteria are not met, then the cited reference(s) fails to render obvious the claimed invention and, thus, the claimed invention is distinguishable over the cited reference(s).

**Audet et al. in view of El-Husayni**

Claims 4-7 have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Audet et al. in view of U.S. Patent No. 5,940,784 to El-Husayni. This rejection is respectfully traversed because Audet et al. and El-Husayni, considered singly or in combination, fail to disclose the invention as set forth in independent Claim 1 of the present invention, upon which Claims 4-7 depend.

As described hereinabove, Audet et al. fails to disclose each and every element claimed in Claim 1 of the present invention. In addition, the Official Action does not allege that El-Husayni makes up for any of the deficiencies in Audet et al. described hereinabove. Accordingly, it is respectfully submitted that the proposed combination of Audet et al. and El-Husayni would not yield the present invention as set forth in Claim 1 and therefore does not disclose the present invention as set forth in Claims 4-7.

In addition, El-Husayni itself does not disclose the elements of Claims 4-7. For instance, El-Husayni discloses that a calibration procedure for calibrating a testing instrument includes that “a reference sample with known thermal conductivity is measured to calibrate the instrument.” This differs from the present invention as set forth in Claims 4-7 because the calibration described in these claims refer to the material sample being tested.

Moreover, the Official Action has failed to provide a proper motivation for the proposed combination of Audet et al. and El-Husayni. Accordingly, it is respectfully submitted that the disclosures of Audet et al. and El-Husayni, considered either singly or in combination fail to disclose all of the features claimed in Claims 4-7 of the present invention. The Examiner is thus respectfully requested to withdraw the rejection of Claims 4-7.

**Osone et al. in view of Stanley et al.**

Claims 10-23 have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Osone et al. in view of U.S. Patent No. 3,733,887 to Stanley et al. This rejection is respectfully traversed because Osone et al. and Stanley et al., considered singly or in combination, fail to disclose the invention as set forth in independent Claims 10 and 15 of the present invention.

Osone et al. does not anticipate the present invention as set forth in Claims 10 and 15 because Osone et al. does not disclose each and every element claimed in Claims 10 and 15. For instance, Osone et al. does not disclose a compensating controller adjusting the pressure applied to a thermal interface material (TIM) sample to be constant even though the TIM sample expands and contracts with changes in its temperature, as claimed in Claim 10. In addition, Osone et al. fails to disclose the step of adjusting the pressure applied to the TIM to be constant even though the TIM sample expands and contracts with changes in its temperature, as claimed in Claim 15.

The Official Action asserts that a compensating controller is depicted in FIG. 6 of Osone et al. and that paragraphs 31 and 32 of Osone et al. disclose the step of adjusting the pressure. This assertion is respectfully traversed because these cited sections in Osone et al. do not disclose a compensation controller as claimed in Claim 10 nor the pressure adjusting step claimed in Claim 15 of the present invention.

With respect first to FIG. 6 of Osone et al., there is shown a diagram for showing a configuration for measuring the thermal resistance of a pair of members sandwiching a resin therebetween. (paragraph 77). There appears to be no disclosure in Osone et al. to indicate that the configuration shown in FIG. 6 of Osone et al. could be construed as a compensating controller that adjusts the pressure applied to the TIM to be constant even though the TIM

sample expands and contracts with changes in its temperature. Therefore, the assertion that FIG. 6 shows a compensating controller that operates in the manner set forth in Claim 10 of the present invention is improper.

With respect to paragraphs 31 and 32, Osone et al. discusses the design of a thermal structure of a device on which resin is mounted based upon various measured factors. In addition, Osone et al. discloses that the method includes “measuring variation of the thermal resistance of the resin with time when factors giving influence on the thermal resistance of the resin is kept constant over a predetermined period.” This is not the same as adjusting the pressure applied to the TIM to be constant even though said TIM sample expands and contracts with changes in its temperature as set forth in Claim 15.

The Official Action does not rely upon the disclosure contained in Stanley et al. to make up for these deficiencies in Osone et al. Instead, the Official Action relies upon Stanley et al. for its disclosure of copper blocks in a thermal proper measurement device. Therefore, Osone et al. in view of Stanley et al. fails to disclose each and every element claimed in Claims 10 and 15. The Examiner is thus respectfully requested to withdraw the rejection of Claims 10 and 15 as allegedly being unpatentable over the disclosures contained in Osone et al. and Stanley et al.

In addition, the claims that depend from Claims 10 and 15 are also allowable over the disclosures contained in Osone et al. and Stanley et al. at least by virtue of their dependencies upon allowable independent Claims 10 and 15.

### Conclusion

In light of the foregoing, withdrawal of the rejections of record and allowance of this application are earnestly solicited.

**PATENT**

Atty Docket No.: 200209582-2  
App. Ser. No.: 10/660,863

Should the Examiner believe that a telephone conference with the undersigned would assist in resolving any issues pertaining to the allowability of the above-identified application, please contact the undersigned at the telephone number listed below. Please grant any required extensions of time and charge any fees due in connection with this request to deposit account no. 08-2025.

Respectfully submitted,

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Dated: October 15, 2004

By

  
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